

The role of social belonging and exclusion at school and the teacher–student relationship for the development of learned helplessness in adolescents

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Background. Based on learned helplessness theory and conservation of resources theory, the present study explores the role of schools' social environments (i.e., school belonging, school exclusion, and teacher–student relationships) as potential buffers and amplifiers in students' development of learned helplessness during adolescence.

Aims. We examine whether school belonging, school exclusion, and teacher–student relationship moderate the longitudinal association of learned helplessness differently for students from low-track schools and high-track schools.

Sample. The study uses a sample of $N = 1,088$ ($M_{\text{age}} = 13.70$, $SD = 0.53$; 54% girls) adolescent students who participated in a two-wave longitudinal study.

Methods. We conducted latent moderated structural equation modelling to examine whether school belonging, school exclusion, and teacher–student relationship moderate the longitudinal association of learned helplessness differently for students from low-track schools and high-track schools.

Results. The moderation analyses revealed that students from both school tracks are differently affected by school belonging and school exclusion in their development of learned helplessness. Teacher–student relationship did not moderate the association.

Conclusion. Our findings underline the important role of the social environment in students' development of learned helplessness. Particularly, the differential effects found for the different educational tracks highlight the necessary awareness of educators to interindividual differences of their students.

According to the theory of learned helplessness (Abramson, Seligman, & Teasdale, 1978; Peterson, 2010; Seligman & Maier, 1967), learned helplessness results from the repeated perception that the outcome of a specific stressful situation is independent of an individual's behaviour when confronted with that situation. In other words, learned helplessness is effectively 'an internalisation of stable causes following failure' (Covington, 1986, p. 259). If students repeatedly face experiences of failure, then schools become breeding grounds for learned helplessness (Dweck & Goetz, 1978; Walling & Martinek, 1995). Unfortunately, learned helplessness impedes academic success and achievement

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(Filippello, Buzzai, Costa, Orecchio, & Sorrenti, 2020; Määttä, Nurmi, & Stattin, 2007; Sorrenti, Filippello, Orecchio, & Buzzai, 2016; Valås, 2001). As such, it has detrimental effects on an adolescent's future school and professional career (Gordon & Gordon, 2006; Sorrenti et al., 2016). However, school achievement is not only based on individual characteristics (e.g., learned helplessness), but is rather a result of the interaction between both individual characteristics and interpersonal environments (e.g., belonging/exclusion at school, the teacher–student relationship) (Filippello et al., 2020). As social relations outside the family (e.g., peers, teachers) become increasingly important and complex during adolescence (e.g., Bukowski, Simard, Dubois, & Lopez, 2011; Gillen-O'Neel & Fuligni, 2013; Osterman, 2000; Pittman & Richmond, 2007), the benefit of school belonging and positive teacher–student relationships, together with the distress caused by school exclusion, is assumed to be particularly high during this period (see Gunther Moor, 2011; Somerville, 2013).

Accordingly, the present study aims to examine whether perceived school belonging, exclusion, and the teacher–student relationship moderate the development of learned helplessness during adolescence. As students' interpersonal environments are mainly determined by their educational context and specific school culture, the study further aims to detect whether these potential moderators function differently for students from low-track and high-track schools.

School belonging, exclusion, and the teacher–student relationship as potential moderators of learned helplessness

Learned helplessness is defined as 'the motivational, cognitive, and emotional deficits that may follow from an organism's exposure to uncontrollable stressors' (Isaacowitz & Seligman, 2007, p. 567). Students with learned helplessness can be characterized by (1) the belief that they are not in control of their school activities, (2) an inability to see the association between effort and results, (3) the conviction – after repeated failures – that negative events are uncontrollable and overwhelming, and (4) the belief that failures are a result of their poor ability. These characteristics leads to (5) the avoidance of tasks and challenges (Määttä et al., 2007), (6) reduced persistence and effort (Elliott & Dweck, 1988), (7) social isolation (Verma & Gera, 2014), and (8) worse academic performance (see Filippello, Harrington, Costa, Buzzai, & Sorrenti, 2018; Filippello et al., 2017; Filippello, Sorrenti, Buzzai, & Costa, 2015; Sorrenti et al., 2016). Given these detrimental effects of learned helplessness at school, which can negatively affect students' future school and professional careers (Gordon & Gordon, 2006; Sorrenti et al., 2016), the question arises as to how educators can prevent or intervene in the development of learned helplessness.

A promising approach in this regard could be the stress-buffering hypothesis (Cassel, 1976; Cobb, 1976; Cohen & Wills, 1985), which states that social resources can mitigate the effects of stressful events (see Cohen & Pressman, 2004). As learned helplessness involves the exposure of students to uncontrollable stressors at school, the teacher–student relationship, together with a student's sense of school belonging, could be protective factors that prevent or intervene in the development of learned helplessness. School belonging refers to a student's sense of being accepted, valued, and integrated at school, together with being encouraged by others (Baumeister & Leary, 1995; Faircloth & Hamm, 2005; Osterman, 2000). The teacher–student relationship refers to how well a student gets along with their teachers on both an interpersonal and an institutional level (Hagenauer & Raufelder, 2022). Previous cross-sectional research with secondary school

students supports the stress-buffering hypothesis within the framework of learned helplessness, as it has been demonstrated that both school belonging and positive teacher–student relationships are negatively associated with learned helplessness (see Raufelder, Sahabandu, Sánchez Martínez, & Escobar, 2015), whereas a controlling teacher style has positively predicted learned helplessness (Filippello et al., 2015, 2017). However, none of these studies followed a longitudinal design and directly tested the buffering hypothesis, which implies that social resources function as moderators.

In contrast, social exclusion at school might be a risk factor in the development of learned helplessness, as it gives rise to feelings of further stress. Social exclusion is often related to repeated perceptions of rejection and ostracism (Baumeister & DeWall, 2005; Naylor, Cowie, Cossin, De Bettencourt, & Lemme, 2006) and is associated with feelings of being a loner and entirely disliking school (Ramm et al., 2006). Studies on social exclusion in schools have indicated that it gives rise to academic difficulties (Arslan, 2016; Buhs, Ladd, & Herald, 2006; Ladd, & Kochenderfer-Ladd, 2016; Raabe, 2019) and feelings of learned helplessness (Toner & Munro, 1996) and hopelessness (Siyahhan, Aricak, & Cayirdag-Acar, 2012). However, to our knowledge, there are no recent studies on social exclusion and learned helplessness in an adolescent school context.

Differences in school track

The conservation of resources (COR) theory states that the appraisal of feeling stressed is largely influenced by cultural determinants, such as the educational context and the specific school culture (Hobfoll, 1988, 1989, 2001; Hobfoll & Lilly, 1993). The German secondary school system allocates students to specific educational tracks. Low-track schools prepare students for vocational careers (i.e., ‘Oberschule’), and high-track schools prepare students for academic careers (i.e., ‘Gymnasium’). These school types differ in their didactic concepts, achievement orientations, and school cultures (Maaz, Trautwein, Lüdtke, & Baumert, 2008). Although COR does not make specific predictions about how different contexts might affect the appraisals of feeling stressed, previous research has largely shown that features of the students’ social backgrounds are highly influential in track allocation in the first place (Dustmann, 2004; Hanushek & Wößmann, 2006; Lucas, 2001). Therefore, if social relationships determine academic track, it is equally plausible that such relationships manifest differently across academic tracks.

Research has shown that low-track students tend to feel less of a sense of school belonging in comparison with high-track students (see Eccles & Roeser, 2010; Roeser, Eccles, & Sameroff, 1998). No research to date has investigated whether students from low-track schools and students from high-track schools experience more or less exclusion at school. To our knowledge, no study on learned helplessness has considered the different school tracks in Germany. However, it has been shown in the United States that ‘the negative effects of being a low and middle track [...] could serve as sufficient conditioning events to instill a sense of learned helplessness in minority and low SES students’ (Ndege, 2012, p. 21; see also Olson & Schober, 1993). This might also be true of German students, because students who attend low-track schools in Germany often come from lower SES families, whereas students from high-track schools come from higher SES families (Deutsches PISA-Konsortium, 2001; Hyland, 2006).

With regard to school track differences and the perception of the teacher–student relationship, a German study found that low-track adolescent students tend to perceive the teacher–student relationship more positively than students at high-track schools (Tillmann & Meyer, 2001). By contrast, another German study demonstrated that

high-track adolescent students reported more respectful and appreciative relationships in comparison with low-track students and that low-track students more often reported distanced and distrustful relationships with their teachers (Schwertfeger, 2012). In addition, an early study in the United States showed that students in low-track classes perceived their relationships with their teachers to be more alienated, distanced, and punitive in comparison with students in high-track classes (Oakes, 1982). Similarly, another study indicated that teachers of low-track classes provided significantly less emotional, organizational, and instructional support in comparison with teachers of high-track classrooms (Donaldson, LeChasseur, & Meyer, 2017). To summarize, students from low-track schools and classes tend to perceive their teacher–student relationships more negatively, although one study found that the opposite occurred. This may have been because the teacher–student relationship is a complex construct that is subject to strong interindividual differences and situational influences (Hagenauer & Raufelder, 2022; Raufelder & Hoferichter, 2015).

Hypotheses

In line with the stress-buffering hypothesis (Cassel, 1976; Cobb, 1976; Cohen & Wills, 1985) and the COR theory (Hobfoll, 1988, 1989), it was hypothesized (H1a) that school belonging, school exclusion, and the teacher–student relationship moderate the development of learned helplessness from the beginning of eighth grade to middle of the ninth grade and (H1b) that these moderators function differently for students from low-track and high-track schools.

Method

Participants and procedure

The present study is based on a sample of 1,088 eighth-grade students in the German school year 2011/2012 (T1 = time 1: $M_{\text{age}} = 13.70$, $SD = 0.53$; 54% girls). These students were again approached 1.5 years later at the end of grade 9, when 845 students returned for the second wave of data collection (T2 = time 2: $M_{\text{age}} = 14.86$, $SD = 0.49$; 55% girls; dropout rate of 22.33%). The students came from 23 public secondary schools ($N_{\text{classes}} = 71$) in Brandenburg, Germany.

Because the present study hypothesized differential effects based on the school track of the students, the sample was split into a subsample of students who attended high-track schools (e.g., ‘Gymnasium’; $N = 779$, $M_{\text{age}} = 13.09$, $SD = 0.50$; 57% girls) and another subsample of students who attended low-track schools (e.g., ‘Oberschule’, $N = 309$, $M_{\text{age}} = 13.30$, $SD = 0.47$; 46.4% girls).

A strict procedure was followed both prior to and during the data collection in order to meet the ethical standards regarding study conduct (American Psychological Association, 2002). First, formal approval was obtained from the Department of Education, Youth, and Sport of the federal state of Brandenburg. Second, the randomly sampled schools were approached and asked to participate in the study. Third, the students and their parents were informed about the nature of the study and the procedure of data collection. Written consent was obtained from the parents in order to allow the students to participate. Fourth and finally, on the data collection day, the students were again informed about the voluntary and anonymous nature of the study by two trained research assistants, and were told that they could refuse to participate or to answer any specific questions at any time.

The research assistants then explained any ambiguous items and, specifically, how to use the Likert scales. They remained present throughout the data collection.

Measures

Independent variable and dependent variable: Learned helplessness

Learned helplessness was assessed using the *helplessness in school* scale (Jerusalem & Schwarzer, 1993). The scale consists of five items (e.g., 'Whether I work hard or not, my grades do not improve anyway'), ranging from 1 ('strongly disagree') to 4 ('strongly agree') on a 4-point Likert scale. The scale achieved proper reliability across both groups and both points of measurement (T1: $\alpha_{\text{low-track}} = .84$, $\alpha_{\text{high-track}} = .81$; T2: $\alpha_{\text{low-track}} = .83$, $\alpha_{\text{high-track}} = .83$).

Moderator variable: School belonging and school exclusion

School belonging and *school exclusion* were measured using the *school belonging* subscale from the PISA 2003 questionnaire (Ramm et al., 2006). Following the concerns of Morin et al. (2015) that scales positively and negatively worded items may produce multidimensionality within the constructs, we decided to separate both types of items. The scale *school belonging* consists of three positively worded items (e.g., 'My school is a place . . . where I feel I belong to'), which are rated on a 4-point Likert scale (1 = 'strongly disagree', 4 = 'strongly agree'). The scale achieved good reliability (T1: $\alpha_{\text{low-track}} = .70$, $\alpha_{\text{high-track}} = .76$). *School exclusion* was assessed with the five negatively worded items, which were also measured on a 4-point Likert scale (e.g., 'My school is a place . . . where I feel lonely') that also ranged from 1 ('strongly disagree') to 4 ('strongly agree'). The scale achieved good reliability in both groups (T1: $\alpha_{\text{low-track}} = .77$, $\alpha_{\text{high-track}} = .76$).

Moderator variable: Teacher–student relationship

The teacher–student relationship was assessed with the PISA instrument (Ramm et al., 2006). The scale is comprised of five items that assess the quality of the relationships between students and teachers in a school (e.g., 'Most teachers are interested in what I have to say'), ranging from 1 (strongly disagree) to 4 (strongly agree) on a 4-point Likert scale. The scale yielded good reliability in both groups (T1: $\alpha_{\text{low-track}} = .78$, $\alpha_{\text{high-track}} = .77$).

Socio-economic status

We utilized an item by Kunter et al. (2002) as a proxy to measure students' SES. The item asks students about the number of books in their room (e.g., 'How many books do you have in your room?'). The answers were measured on a 6-point Likert scale ranging from 1 ('no books') to 6 ('more than 500 books').

Statistical analyses

All the inferential analyses were conducted in Mplus 8.1 (Muthén & Muthén, 1998-2017) with the MLR estimator. In order to test our hypothesis and determine whether school belonging, social exclusion, and the teacher–student relationship moderate the

development of learned helplessness, the latent interactions needed to be estimated. To do so, the latent moderated structural equation approach (LMS; Klein & Moosbrugger, 2000) was used. This approach represents an extension to the conventional SEM framework, as it takes the non-normality of the latent interaction of the predictor and the moderator variable into account (Moosbrugger, Schermelleh-Engel, Kelava, & Klein, 2009). The LMS approach was further extended to include a multigroup design. Multiple-group analysis represents another moderation approach with a categorical (group) indicator.

To account for the multilevel structure of the data (i.e., students nested in classes), all analyses were conducted with the type is complex feature of Mplus. This feature computes standard errors of parameter estimates that take into account stratification and non-independence of observations due to cluster sampling (Asparouhov, 2005; Muthén & Muthén, 1998-2017).

Before these analyses could be conducted, the establishment of measurement invariance was compulsory to ensure that the indicators measured the same underlying latent construct across both times of measurement and across both groups. Comparing groups on latent means requires the establishment of strong factorial invariance, meaning that factor loadings and factor intercepts need to be invariant (Brown, 2015). Following Little (2013), a series of confirmatory factor analyses with an increasing number of parameter restrictions (CFAs) was conducted to examine whether the invariance assumptions held. First, a CFA was specified in which factor loadings and factor intercepts could vary across groups and time (Model 0: configural invariance). Second, factor loadings were equated across groups while they could still vary across time (Model 1a: weak factorial invariance across groups). This restriction was extended across time, while factor intercepts could still vary across groups and time (Model 1b: weak factorial invariance across groups and time). Third, factor intercepts were additionally equated across groups (Model 2a: strong factorial invariance across groups). Last and similar to Model 1b, the intercept restriction was extended to the longitudinal factor (Model 2b: strong factorial invariance across groups and time), meaning that neither factor loadings nor factor intercepts could vary across groups or time. The subsequent models were compared using the following cut-off criteria (Chen, 2007): Invariance for factor loadings (Model 1a/b) is indicated if the model comparisons lead to $\Delta\text{CFI} < -.010$, $\Delta\text{RMSEA} < .015$, and $\Delta\text{SRMR} < .030$. Invariance for factor intercepts (Model 2a/b) is indicated if the model comparisons lead to $\Delta\text{CFI} < -.010$, $\Delta\text{RMSEA} < .015$, and $\Delta\text{SRMR} < .010$. General model fit was evaluated using the chi-square test of model fit, root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residuals (SRMR) (Hu & Bentler, 1999). Because CFAs are regularly criticized for imposing too severe restrictions on a model (Marsh, Guo, Dicke, Parker, & Craven, 2020), we investigated the possibility of relaxing some restrictions: In all models, we allowed the error terms of two indicators of the school belonging factor to covary. This decision resulted in strongly improved model fit indices, while the parameter estimates were not substantially affected. Appendix A provides detailed information about model fit and parameter estimates of the final model without the residual correlation.

After ensuring measurement invariance, four models were specified, because conventional model fit indices are not available for LMS (i.e., χ^2 , CFI, RMSEA, SRMR). First, a structural equation model without interaction terms was specified, which would provide the necessary fit indices (Model 0). In this model, learned helplessness at T2 was regressed on SES, learned helplessness at T1, school belonging at T1, school exclusion at

T1, and teacher–student relationship at T1. Second, in order to compare this model with a model that encompasses interaction terms, Model 0 was specified with the integration algorithm (Model 1). Subsequently, the interaction terms were added to the model (Model 2). To determine whether the model with interaction terms or without the interaction terms fitted the data better, the chi-square difference test based on raw log-likelihood values was conducted as these are preferable over robust or strictly positive statistics in LMS (Gerhard et al., 2014). A significant difference test suggests that the model with interaction terms fits the data better, while a non-significant test does either indicate an equal fit or a worse fit (Maslowsky et al., 2015). Consequently, all regression coefficients were evaluated individually in a stepwise manner by means of the Wald test to check for group differences. The final and more restrictive model (Model 3) freely estimated only those coefficients across both groups, which were significant in the Wald test (see ESM1 – Model Syntax). The other coefficients were equated across both groups. This final model included regressions from the predictors (i.e., covariate SES, learned helplessness at T1, school belonging at T1, school exclusion at T1, teacher–student relationship at T1, interaction between learned helplessness at T1 and school belonging at T1, interaction between learned helplessness at T1 and school exclusion at T1, and interaction between learned helplessness at T1 and teacher–student relationship) on the outcome (i.e., learned helplessness at T2), while ensuring the measurement invariance constraints from the preliminary analyses.

Missing data

As in many studies, our data were subject to missing data. Overall, 8.23% of data (item level) were missing, which resulted from $n = 423$ incomplete cases. Consequently, $n = 665$ cases provided full information. Missingness across variables varied between 0% and 28.22%. The most prominent missing data pattern resulted from those students who did not participate in the second wave of data collection ($n = 267$, 24.54%). The second most prominent missing data pattern ($n = 20$, 1.84%) encompassed those students who did not provide information regarding their SES.

The attrition analyses revealed that students' gender was significantly associated with missingness in learned helplessness at T2. Thus, boys were significantly less likely than girls to report their experienced learned helplessness. Additionally, there were achievement-related patterns of missingness; that is, lower grades in Math were associated with missing values in teacher–student relationship. Furthermore, lower grades in German were associated with missing values in school belonging, school exclusion, and teacher–student relationship (Appendix B). Consequently, we assumed that data missing at random (MAR; Rubin, 1987) enabled us to make use of advanced missing values procedures. Thus, missingness was handled using Mplus' standard setting – full information maximum likelihood estimation (FIML). This approach makes use of all available information to estimate the models and is considered a state-of-the-art technique for handling missing data (Schafer & Graham, 2002).

Results

Descriptive statistics and intercorrelations

Table 1 provides the descriptive summary statistics and the bivariate correlations of the instruments used. As hypothesized, the correlation matrix indicates significant

Table 1. Correlation matrix and manifest descriptive statistics

	2	3	4	5	6	Range	M	SD	Skewness	Kurtosis
<i>Students from low-track schools</i>										
1. Learned helplessness at T1	.36***	-.16**	.35***	-.36***	-.04	1-4	1.94	0.63	0.35	-0.38
2. Learned helplessness at T2		-.11	.17*	-.24***	-.04	1-4	1.98	0.63	0.25	-0.32
3. School belonging at T1			-.56***	.15*	-.05	1-4	2.80	0.62	-0.44	0.37
4. School exclusion at T1				-.29***	-.01	1-4	1.90	0.61	0.74	0.91
5. Teacher-student relationship at T1					.03	1-4	2.80	0.55	-0.14	0.28
6. SES						1-7	2.76	1.05	1.07	1.82
<i>Students from high-track schools</i>										
1. Learned helplessness at T1	.51***	-.21***	.45***	-.40***	-.11**	1-4	1.80	0.59	0.72	0.61
2. Learned helplessness at T2		-.07	.22***	-.29***	-.09*	1-4	1.85	0.63	0.62	0.05
3. School belonging at T1			-.51***	.21***	-.11**	1-4	2.96	0.57	-0.51	0.80
4. School exclusion at T1				-.38***	.05	1-4	1.73	0.55	0.80	0.78
5. Teacher-student relationship at T1					.09*	1-4	2.87	0.48	-0.30	0.97
6. SES						1-7	3.85	1.25	0.52	-0.08

* $p < .05$.; ** $p < .01$.; *** $p < .001$.

associations for learned helplessness across both time points, and with school belonging, school exclusion, and teacher–student relationship in both groups of students, however with substantially different coefficients. Moreover, SES was a significant correlate only for students from high-track schools.

Preliminary analyses: Confirmatory factor analyses and measurement invariance

Initially, a series of CFAs was conducted to establish the initial measurement models and to examine measurement invariance across the groups and across time. Table 2 provides the model fit statistics of the increasingly restrictive models, together with the comparison of subsequent models. Following the cut-off values provided by Chen (2007), the assumption of strong factorial invariance of factor loadings and intercepts held, which meant that the indicators measured the same underlying latent constructs, both across groups and across time. Table 3 exhibits the standardized factor loadings of the strong invariant model. The parameter restrictions of this model have henceforth been used for the main analyses.

Comparing the groups on latent means

Students in high-track schools reported lower values of learned helplessness at T1 (estimate = -0.26 , $p < .01$), while they did not differ significantly at T2 (estimate = -0.14 , $p = .19$). Moreover, students in high-track schools reported significantly higher values with regard to school belonging at T1 (estimate = 0.33 , $p < .001$) and significantly lower values with regard to social exclusion at T1 (estimate = -0.28 , $p < .001$). The two groups did not differ significantly in teacher–student relationships at T1 (estimate = 0.14 , $p = .21$). Additionally, a two-sample *t*-test of the SES proxy revealed that students from low-track schools report lower values of SES than students from high-track schools ($t(572) = -14.00$, $p < .001$; see Table 1 for mean values and standard deviations).

Latent mean differences across time

Longitudinally, the group of students in low-track schools did not exhibit any significant differences in their development of learned helplessness from T1 to T2 (estimate = 0.09 , $p = .36$). Contrarily, the group of students in high-track schools exhibited a statistically significant increase in learned helplessness from T1 to T2 (estimate = 0.12 , $p < .05$).

Table 2. Measurement invariance testing

	χ^2 (df)	p (χ^2)	CFI	RMSEA [90% CI]	SRMR	Δ CFI	Δ RMSEA	Δ SRMR
Model 0	814.30 (428)	<.001	.94	0.04 [0.04–0.05]	.06			
Model 1a	854.73(446)	<.001	.94	0.04 [0.04–0.05]	.07	.00	.00	.01
Model 1b	865.43 (450)	<.001	.94	0.04 [0.04–0.05]	.07	.00	.00	.00
Model 2a	929.07 (468)	<.001	.93	0.04 [0.04–0.05]	.07	-.01	.00	.00
Model 2b	945.50 (472)	<.001	.93	0.04 [0.04–0.05]	.07	.00	.00	.00

Note. Model 0 = baseline model, Model 1a = weak factorial invariance across groups, Model 1b = weak factorial invariance across groups and time, Model 2a = strong factorial invariance across groups, Model 2b = strong factorial invariance across groups and time; the final columns indicate model fit comparisons between the two subsequent models (Chen, 2007).

Table 3. Range of standardized factor loadings (λ_{\min} – λ_{\max}) for the latent factors

latent factor	Low track (λ_{\min} – λ_{\max})	High track (λ_{\min} – λ_{\max})
Learned helplessness at T1	.56–.76	.56–.76
Learned helplessness at T2	.57–.78	.59–.79
School belonging at T1	.63–.78	.63–.78
School exclusion at T1	.28–.79	.28–.79
Teacher–student relationship at T1	.62–.65	.62–.65

Note. Standardized latent factor loadings are reported from the final measurement Model 2b; all reported factor loadings were significant estimates at $p < .001$.

Hypothesis testing: Latent moderated structural equations

Before the hypothesis of the potential moderating effects could be tested, a series of models were run to a) evaluate the fit of the data to the hypothesized models, and b) determine whether a model with moderation effects (e.g., interaction terms) fitted the data better than a model without interaction terms. First, a model (Model 0) was conceptualized without interaction terms or the MLR estimator. This model exhibited a good fit to the data ($\chi^2(509) = 1,012.106$, $p(\chi^2) < .001$, CFI = .93, RMSEA [90% CI] = 0.04 [.04–.05], SRMR = .07). Afterwards, the estimator was changed to *integration algorithm* and two models were run, namely, a model without interaction terms (Model 1) and a model with interaction terms (Model 2). Both models were subsequently compared using the chi-square difference test. The test reached the level of significance ($\chi^2(6) = 14.15$, $p < .05$), indicating that the model with interaction terms fitted the data better. Finally, to determine whether there are significant group differences between students from different educational tracks, Model 2 was evaluated for group differences. For that, equality constraints were added separately for each main effect and both models were compared by the Wald test. The Wald test was significant only for the moderation effect of school belonging ($\chi^2(1) = 5.59$, $p = 0.02$) and school exclusion ($\chi^2(1) = 13.94$, $p < .001$), while it remained insignificant for the five other main effects, meaning that only these two interaction effects should be estimated separately for both groups. Consequently, all the effects presented were taken from this final model – Model 3.

Effects for students in low-track schools

The final model included correlations between all the independent variables. In the group of students from low-track schools, learned helplessness at T1 was negatively significantly associated with both school belonging ($\phi_{\text{std}} = -.20$, $p < .05$), positively with school exclusion ($\phi_{\text{std}} = .27$, $p < .01$), and negatively with teacher–student relationship ($\phi_{\text{std}} = -.41$, $p < .001$). Moreover, school belonging at T1 was highly negatively associated with social exclusion at T1 ($\phi_{\text{std}} = -.79$, $p < .001$) and positively with teacher–student relationship at T1 ($\phi_{\text{std}} = .15$, $p < .05$). Finally, social exclusion at T1 and teacher–student relationship at T1 were negatively associated ($\phi_{\text{std}} = -.15$, $p < .05$). All predictors were insignificantly related to the SES: learned helplessness at T1 ($\phi_{\text{std}} = -.07$, $p = .45$), school belonging ($\phi_{\text{std}} = -.06$, $p = .59$), school exclusion ($\phi_{\text{std}} = .06$, $p = .51$), and teacher–student relationship ($\phi_{\text{std}} = .04$, $p = .63$).

Table 4 exhibits all the direct effects and the effects of the interaction terms. The model indicated that the autoregressive association of learned helplessness between T1 and T2 was highly positively significant ($B = .57$, $\beta = .54$, $SE = 0.06$, $p < .001$) meaning

Table 4. Results of Latent moderated structural equations for learned helplessness

Coefficient	Learned helplessness at T2							
	Low track				High track			
	B	β	SE	p	B	β	SE	p
1. Learned helplessness at T1	.57	.54	.06	<.001	.57	.53	.06	<.001
2. School belonging at T1	.04	.04	.15	=.78	.04	.04	.15	=.46
3. School exclusion at T1	.01	.01	.12	=.92	.01	.01	.12	=.89
4. Teacher–student relationship at T1	-.14	-.11	.07	<.05	-.14	-.11	.07	<.05
5. Interaction between school belonging at T1*learned helplessness at T1	-.46	-.21	.31	=.15	.48	.21	.22	<.05
6. Interaction between school exclusion at T1*learned helplessness at T1	-.67	-.36	.24	<.01	.48	.25	.22	<.01
7. Interaction between teacher–student relationship at T1*learned helplessness at T1	.22	.09	.13	=.08	.22	.09	.13	=.08
SES	.01	.03	.01	=.10	.01	.03	.01	=.10

Note. Significant effects are displayed in bold at the $p < .05$ level.

that learned helplessness develops stable from early to middle adolescence. Additionally, teacher–student relationship was negatively predictive of learned helplessness at T2 ($B = -.14$, $\beta = -.11$, $SE = .07$, $p < .05$). Moreover, as the interaction term between learned helplessness at T1 and social exclusion at T1 was significantly predictive of learned helplessness at T2 ($B = -.67$, $\beta = -.36$, $SE = .24$, $p < .01$), we can assume that social exclusion moderates the development of learned helplessness. Consequently, this moderation effect was plotted to evaluate the effect depending on different values of the predictor and the moderator variable (Fig. 1).

Effects for students in high-track schools

The final model included correlations between all independent variables. In the group of students from high-track schools, learned helplessness at T1 was significantly negatively associated with school belonging ($\phi_{\text{std}} = -.29$, $p < .001$), positively associated with social exclusion at T1 ($\phi_{\text{std}} = .50$, $p < .001$), and negatively associated with teacher–student relationship at T1 ($\phi_{\text{std}} = -.53$, $p < .001$). Moreover, school belonging at T1 was highly negatively associated with social exclusion at school at T1 ($\phi_{\text{std}} = -.84$, $p < .001$) and positively associated with teacher–student relationship at T1 ($\phi_{\text{std}} = .33$, $p < .001$). Finally, social exclusion at T1 and teacher–student relationship at T1 were negatively associated ($\phi_{\text{std}} = -.38$, $p < .001$). Contrarily to the students from low-track schools, for students from high-track schools, SES correlated significantly with all other predictors: negatively with learned helplessness at T1 ($\phi_{\text{std}} = -.11$, $p < .01$) and school belonging at T1 ($\phi_{\text{std}} = -.13$, $p < .01$), and positively with school exclusion ($\phi_{\text{std}} = .11$, $p < .05$) and teacher–student relationship at T1 ($\phi_{\text{std}} = .10$, $p < .05$).

Table 4 exhibits all the direct effects and the effects of the interaction terms. The model indicated that the autoregressive association of learned helplessness between T1 and T2 was highly positively significant ($B = .57$, $\beta = .53$, $SE = .06$, $p < .001$) meaning that learned helplessness develops stable from early to middle adolescence. Furthermore,

teacher–student relationship at T1 negatively predicted learned helplessness at T2 ($B = -.14$, $\beta = -.11$, $SE = .07$, $p < .05$), meaning that the higher students rate their teacher–student relationship in early adolescence, the less learned helplessness they report in middle adolescence. Moreover, as the interaction term between both learned helplessness at T1 and school belonging at T1 ($B = .48$, $\beta = .21$, $SE = .22$, $p < .05$), and between learned helplessness at T1 and school exclusion at T1 ($B = .48$, $\beta = .25$, $SE = .22$, $p < .01$) was significantly predictive of learned helplessness at T2, we can assume that school belonging and exclusion moderate the development of learned helplessness. Accordingly, these moderation effects were plotted to evaluate the effects of school belonging (Fig. 2) and school exclusion (Fig. 3).

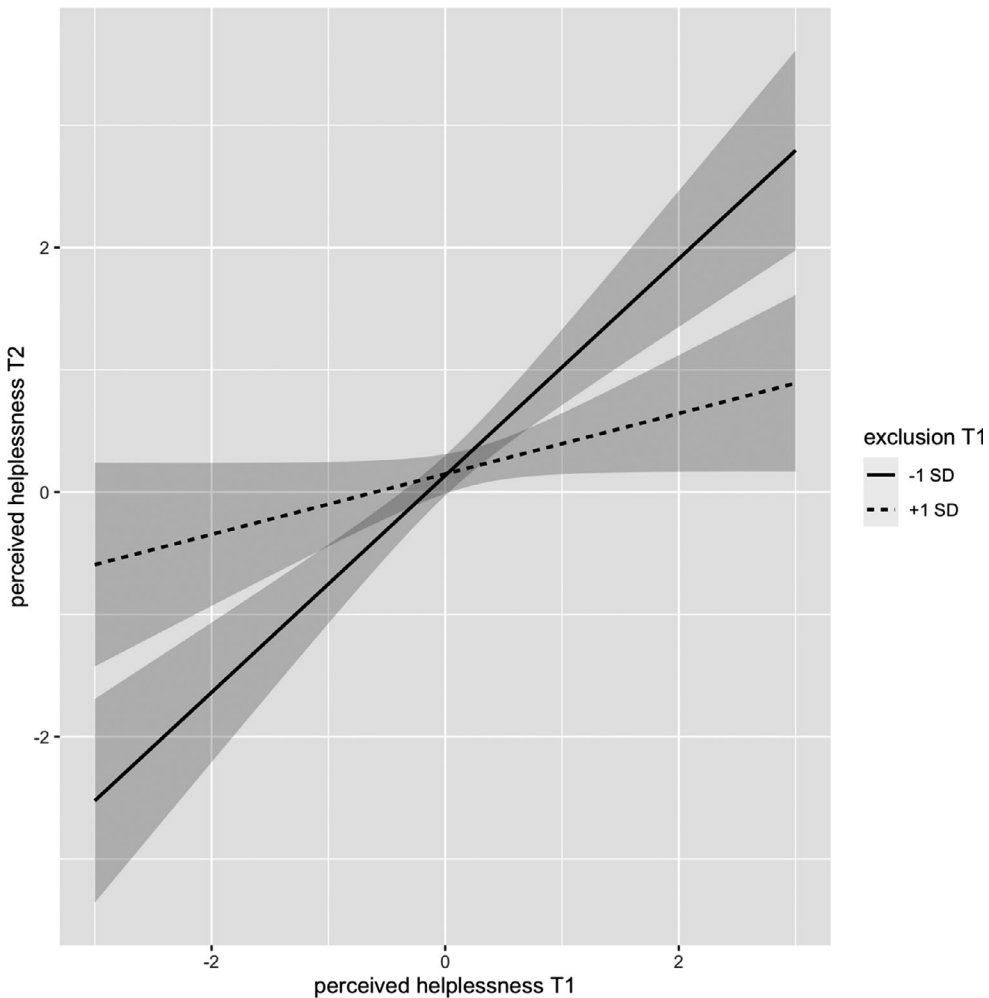


Figure 1. Moderation effect of school exclusion on the association between learned helplessness at T1 and T2 for student in low-track schools. Note. The y-axis shows learned helplessness at T2, while the x-axis shows learned helplessness (help) at T1.

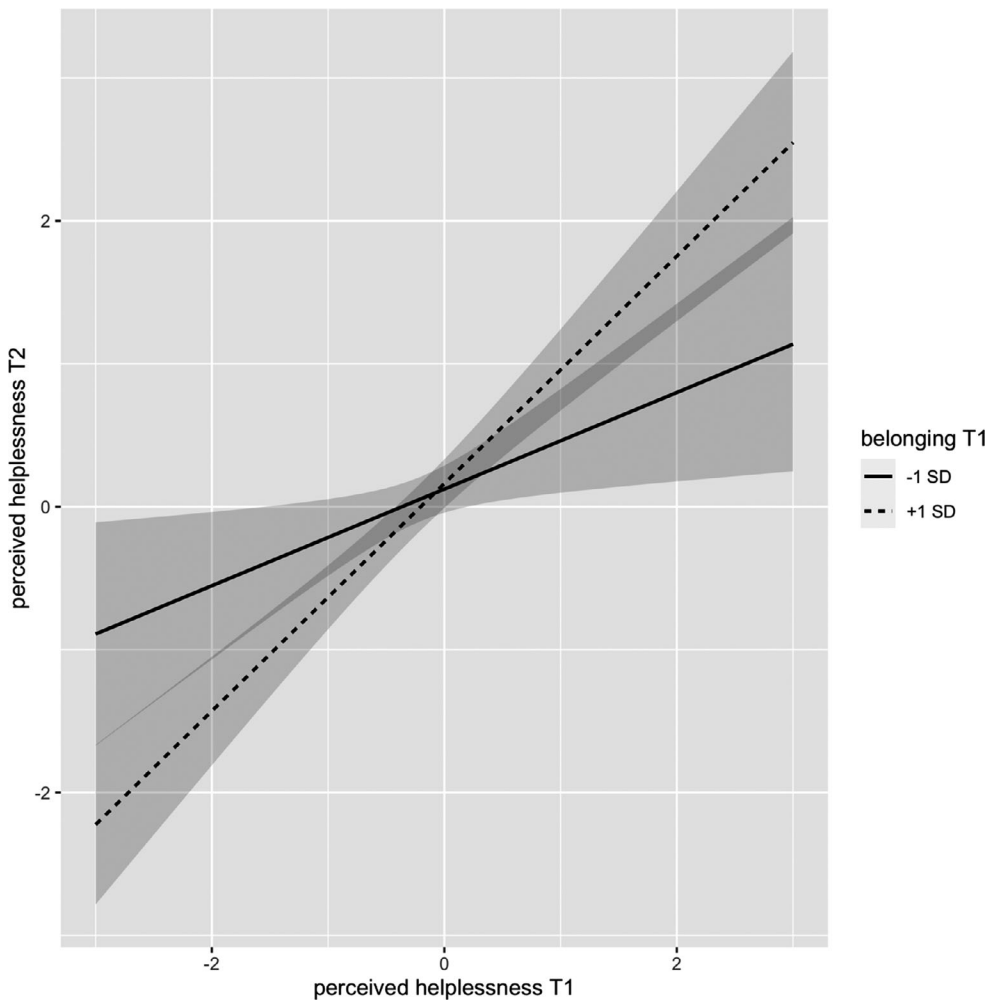


Figure 2. Moderation effect of school belonging on the association between learned helplessness at T1 and T2 for student from high-track schools. *Note.* The y-axis shows learned helplessness at T2, while the x-axis shows learned helplessness at T1.

Discussion

First, this study aimed to deepen the research findings on adolescent learned helplessness in the school context by adopting a longitudinal approach and examining the role of social resources within this context. More particularly, following the stress-buffering hypothesis (Cassel, 1976; Cobb, 1976; Cohen & Wills, 1985), we examined whether school belonging, exclusion, and the teacher–student relationship act as moderators in the development of learned helplessness. Second, the study aimed to uncover possible school-specific differences in this interplay. According to the COR theory (Hobfoll, 1988, 1989), stress – and learned helplessness is, after all, the uncovering of uncontrolled stressful experiences – must always be considered in its respective (school-specific) context. By adopting this approach, we intended to examine the role of social resources in potential prevention and intervention approaches and to derive school form-specific implications.

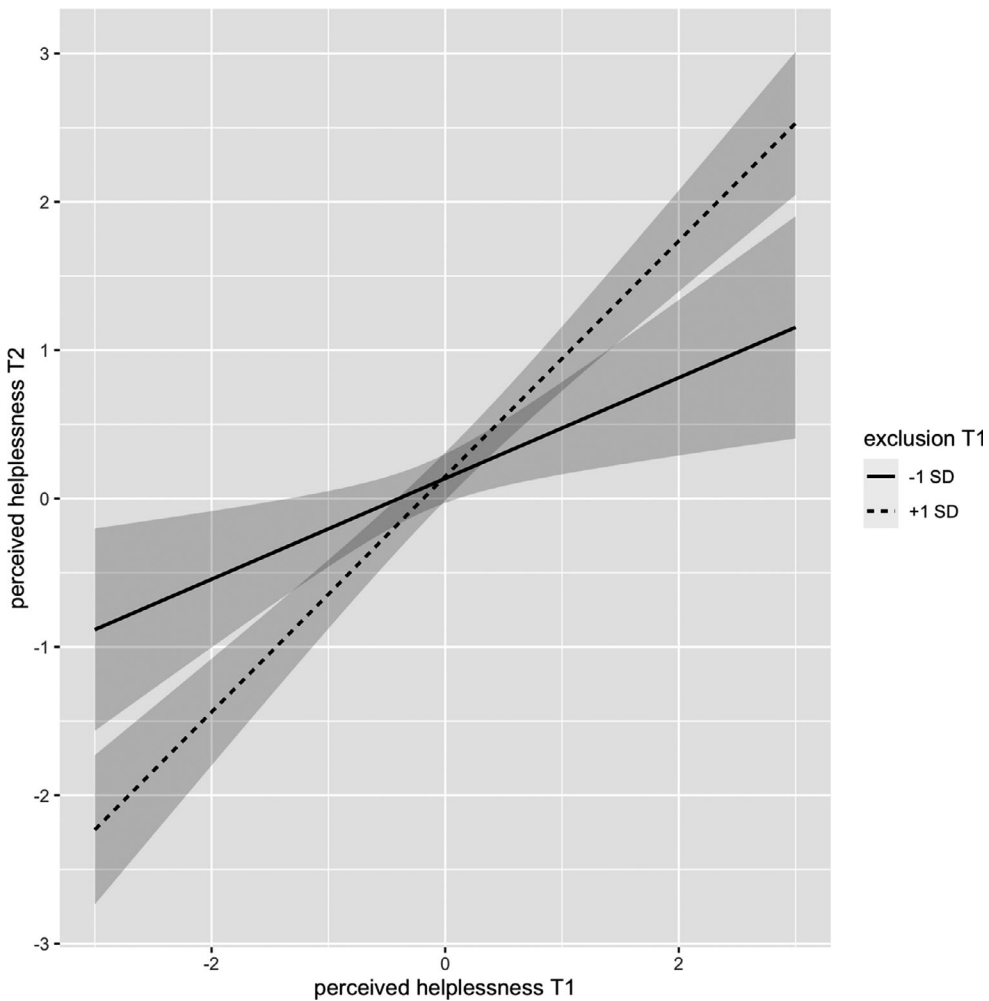


Figure 3. Moderation effect of school exclusion on the association between learned helplessness at T1 and T2 for student from high-track schools. *Note.* The y-axis shows learned helplessness at T2, while the x-axis shows learned helplessness at T1.

Hypothesis 1a (i.e., school belonging, school exclusion, and the teacher–student relationship moderate the development of learned helplessness) was partly confirmed, as school belonging and exclusion moderated the development of adolescent learned helplessness from T1 to T2. However, these findings did not confirm the stress-buffering hypothesis in relation to learned helplessness. While high-track students perceived learned helplessness to a high degree at T1, their school belonging was also intensified at T2. This contradicts previous cross-sectional studies that found a negative relationship between learned helplessness and both school belonging and the teacher–student relationship, and a positive relationship between learned helplessness and a controlling teacher style (Filippello et al., 2017, 2020; Raufelder et al., 2015). One possible reason for this particular effect could be found in the nature of the German tracks: If students cannot live up to the high-track standards, they face the possibility of being re-allocated to the lower school track. In addition to doubts about their individual ability that further nurture

learned helplessness (Määttä et al., 2007), the risk of being re-allocated to the lower school track is additionally associated with the fear of being taken from their social environment. If such students perceive a high degree of social belonging, it appears particularly plausible that this combination of high learned helplessness and social belonging would further intensify their learned helplessness over time.

When examining the results of the correlation analyses, we see that both school belonging and the teacher–student relationship were negatively related to learned helplessness at T1 for both groups of students, whereas the association between school belonging at T1 and learned helplessness at T2 was not significantly related. The latter might also explain why the effect of school belonging was reversed in moderation analysis for students from high-track schools. As the interaction term controlled for learned helplessness at T1, the effect of school belonging was not strong enough to buffer the development of learned helplessness from T1 and T2 considering the time frame of 1.5 years between T1 and T2. In other words, the higher the degree of learned helplessness at T1, the lower the effect of school belonging on learned helplessness at T2. However, and in line with the stress-buffering hypothesis (Cassel, 1976; Cobb, 1976; Cohen & Willits, 1985), belonging can buffer the development of learned helplessness when it is low or moderate. Future studies are required in order to verify this finding, with multiple measurement time points and shorter time intervals between the measurement time points in order to rule out the possibility that this result is based on the design of the measurement time points. In contrast to Hypothesis 1a, the teacher–student relationship was not identified as a moderator in the development of adolescent learned helplessness. This might also be due to the 1.5 years between the two measurement points, as the quality of the teacher–student relationship can vary greatly on both an interpersonal and an institutional level (Hagenauer & Raufelder, 2022). Moreover, there was a significant direct effect, indicating a negative association between the quality of the teacher–student relationship at T1 and learned helplessness at T2 for students from both school tracks. This means that fostering the quality of the teacher–student relationship reduces feelings of learned helplessness over time, which is in line with previous cross-sectional research (Raufelder et al., 2015).

In keeping with COR theory, Hypothesis 1b (i.e., moderation effects are different for students from different educational tracks) was confirmed, as the identified moderators functioned differently for students from low-track and high-track schools. First, only school exclusion acted as a moderator for low-track students, whereas both school belonging and exclusion acted as moderators for high-track students. Second, the interaction effects of school exclusion on the development of learned helplessness were exactly the opposite for the high-track and the low-track students. In the case of the low-track students, exclusion buffered the development of learned helplessness. One possible explanation for this result could be that students who experience social exclusion in addition to their feelings of learned helplessness withdraw from school in general. In this way, they are able to deal with, and even reduce, their learned helplessness. This process of alienation may perhaps enable students to ‘successfully’ deal with their helplessness, although one has to bear in mind that such effects exhibit evasion strategies rather than effective ways to cope with learned helplessness. This is in line with studies that have shown that alienation from school is associated with disengagement and a decreased sense of belonging in relation to learning, teachers, and school classmates (see Hascher & Hadjar, 2001). In the case of high-track schools, student exclusion also functioned as a moderator, but with a reverse effect, as social exclusion amplified the development of learned helplessness over time. One possible explanation for this may be that when

high-track students experience social exclusion in addition to their learned helplessness, they experience increased stress and a sense of being out of control, which amplifies their sense of learned helplessness. This is of particular significance in adolescence, when peers become increasingly important (Bukowski et al., 2011; Gillen-O'Neel & Fuligni, 2013; Osterman, 2000; Pittman & Richmond, 2007). The finding therefore supports the assumption that the distress caused by school exclusion is particularly high during this period (see Gunther Moor, 2011; Somerville, 2013). Since no comparable studies to date have examined school exclusion in relation to the development of learned helplessness, replication studies are required in order to verify or refute the identified effects.

Practical implications

Overall, the findings point to the need to sensitize teachers to the issue of learned helplessness, as it affects students from both high-track and low-track schools. A significant increase during adolescence was particularly evident in the case of students from high-track schools, which – considering the negative consequences of learned helplessness in terms of academic learning and achievement variables (Filippello et al., 2020; Gordon & Gordin, 2006; Määttä et al., 2007; Sorrenti et al., 2016; Valås, 2001) – needs to be counteracted. Although the teacher–student relationship was not identified as a moderator, the significant direct path in the model indicates that fostering a positive teacher–student relationship is associated with less learned helplessness at school, and applied to students from both high- and low-track schools. The correlation analyses further indicate that both the teacher–student relationship and belonging were negatively associated with learned helplessness, particularly in eighth grade. This leads us to the conclusion that it is necessary to start preventative interventions for learned helplessness as early as possible in a student's school career. This is further supported by the results of the moderation analysis, which indicate that school belonging only buffers learned helplessness at T2 if the learned helplessness is low or moderate at T1. In other words, if learned helplessness is already high at T1, school belonging will not be strong enough to counteract the increase in learned helplessness. As social exclusion can intensify the development of learned helplessness in students from high-track schools, school practitioners should also be aware of this negative effect. To summarize, it can be stated that learned helplessness can be directly counteracted by teaching methods that are already known. These include show-up alternatives, such as fostering confidence by providing detailed feedback and engaging in constructive discussions about potential causes of failure, fostering student motivation and interest, teaching students to avoid or distract themselves from depressing thoughts, changing unrealistic thoughts to realistic and flexible ones, and creating an environment that encourages students to make an effort even if it results in failure (Paris & Paris, 2001; Schunk & Zimmerman, 1997; Verma & Gera, 2012). However, the early and constant fostering of positive relationships between students and teachers, coupled with school belonging, is also a promising approach to counteracting learned helplessness. This includes measures against social exclusion. There are a couple of interventions that intensify a sense of belonging in students and that have already been tested and evaluated and can be easily implemented in daily school life (i.e., Allen, Kern, Vella-Brodrick, Hattie, & Waters, 2018; Allen, Vella-Brodrick, & Waters, 2016; Wingspread Declaration on School Connections, 2004). Moreover, show-up alternatives are required in order to help students with learned helplessness, such as fostering confidence by providing detailed feedback and engaging in constructive discussions about potential causes of failure (see Paris & Paris, 2001; Schunk

& Zimmerman, 1997). Additionally, this study also illustrates the dramatic consequences of the tracking system. While there is consensus on the importance of high-quality social relationships and their buffering potential, the consequences for high-track students with high learned helplessness and high school belonging are also apparent. In the light of these results, the growing number of comprehensive schools in the German educational system can only be supported, as their students do not face the possibility of being separated from their social relationships.

Strengths, limitations, and future research

This study has certain limitations. First, the two groups – the students from low-track schools ($n = 309$) and the students from high-track schools ($n = 779$) – were not equally distributed. Therefore, it is possible that the higher number of significant effects in the group of high-track students is a result of greater statistical power. Future studies with equally distributed subsamples are necessary to verify or falsify our findings. Second, the study was based solely on self-report data, as the focus on the students' perceptions and feelings warranted their use. This limitation applies particularly to our SES indicator, which was only measured using one item pertaining to the number of books in the students' homes. Therefore, there are some validity concerns that readers should take into considerations when interpreting the findings. Third, with regard to measures, one should bear in mind that, for example, the teacher–student relationship measure represents an individual aggregation across all the teachers that students have. Future studies should be more domain-specific and examine whether the effects emerge equally across all subjects and teachers. Fourth, future studies should also consider school and classroom variables in a multilevel framework, which might differentiate the contextual effects in more detail, not only between educational tracks but also between classrooms and schools. In this study, multilevel analyses were also considered, too – however, as the number of schools was relatively small in this sample and the ICCs of the dependent variables were low as well ($ICC_{\text{low-track}} = 0.03$; $ICC_{\text{high-track}} = 0.05$) – it was decided against it. Finally, fifth, future longitudinal studies with at least three measurement times are warranted in order to identify the potential causal ordering of the variables.

However, in addition to these limitations, the strengths of the study should also be highlighted. Overall, the present results deepen our understanding of learned helplessness in a school context through the study's longitudinal design and its consideration of social resources and stressors. In doing so, the study provides the first findings on the relationship between exclusion and learned helplessness. Furthermore, following COR theory, the study has also taken context into account by analysing the development of learned helplessness in students from high-track and low-track schools separately and identifying the essential differences, particularly in regard to the moderating role of social exclusion. The results could further help teachers and educators to detect, prevent, and intervene in learned helplessness in students.

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Conflicts of interest

All authors declare no conflict of interest.

Author contributions

Stefan Kulakow (Formal analysis; Methodology; Writing – original draft; Writing – review & editing) Diana Raufelder (Conceptualization; Data curation; Funding acquisition; Project administration; Writing – original draft; Writing – review & editing)

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

The following supporting information may be found in the online edition of the article:

Supplementary Material Electronic Supplement 1 (ESM1): Mplus syntax for the final model

Appendix A:

Alternative model without residual correlation

The model without the correlated error terms exhibited an adequate fit to the data ($\chi^2(475) = 1,145.58$, $p(\chi^2) < .001$, CFI = 0.90, RMSEA [90% CI] = 0.05 [0.05–0.06], SRMR = 0.07). Afterwards, as with the final model, the integration algorithm without interaction terms (Model 1) and a model with interaction terms (Model 2) were specified

and subsequently compared using the chi-square difference test. The test reached the level of significance ($\chi^2(6) = 17.09, p < .01$) indicating that the model with interaction terms fits the data better. Table A1 presents the parameter estimates of this model.

Table A1. Results of latent moderated structural equations for learned helplessness

Coefficient	Learned helplessness at T2							
	Low-track				high-track			
	B	β	SE	<i>p</i>	B	β	SE	<i>p</i>
Learned helplessness at T1	.49	.48	.11	<.001	.63	.57	.07	<.001
School belonging at T1	-.16	-.15	.21	=.44	.08	.07	.19	=.68
School exclusion at T1	-.55	-.06	.16	=.74	-.02	-.02	.16	=.88
Teacher–student relationship at T1	-.13	-.11	.09	=.15	-.16	-.13	.10	=.10
Interaction between school belonging at T1*learned helplessness at T1	-.38	-.18	.23	=.10	.37	.16	.23	=.11
interaction between school exclusion at T1*learned helplessness at T1	-.63	-.34	.21	=.002	.32	.16	.16	=.04
Interaction between teacher–student relationship at T1*learned helplessness at T1	.28	.12	.23	=.22	.07	.03	.14	=.62
SES	-.02	-.04	.04	=.68	.01	.02	.01	=.12

Note. Significant effects are displayed in bold at the $p < .05$ level.

Appendix B:

Attrition analyses

Table A2. Correlation between missingness and auxiliary variables

Variables	1	2	3	4
1 Gender (0 = girls; 1 = boys)				
2. SES	-.02			
3. Math grade	-.09*	-.25*		
4. German grade	.19***	-.25*	.58***	
5. Missing variable learned helplessness at T1	-.02	.01	-.04	-.06
6. Missing variable learned helplessness at T2	-.09**	.04	-.03	-.01
7. Missing variable school belonging at T1	-.02	-.01	-.03	-.07*
8. Missing variable school exclusion at T1	-.02	.01	-.03	-.07*
9. Missing variable teacher-student relationship at T1	.01	.01	-.07*	-.06*

Note.. Missing variable denotes whether values were observed ('1') or missing ('0'); T1 = time 1, T2 = time 2.

*** $p < .001$, ** $p < .01$, * $p < .05$.